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Exploring the relationship between Organizational Culture and IT Innovations in the context of extended Enterprise Systems

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Abstract

Organizational culture has been shown throughout the literature to significantly impact upon change, change management and change processes operating within organizations. Socio-Technical innovations such as Enterprise Systems (ES) bring significant change to organizations both during initial implementation, installation and subsequent use. Several researchers have attempted to define the role that national culture plays in the use of an Information System and research suggests that culture impacts ES success and reconfirms that culture impacts change processes. However, research, whilst indicating that organizational culture does play a role, fails to identify 'how' organisational culture affects these unique IT Innovations. This research addresses this gap, which is important for multinational corporations spanning multiple regions and industries. This paper reports on the design of the study investigating the relationship between organizational culture and IT innovation success in the context of extended ES.

Keywords

Organizational culture, enterprise system, Enterprise Systems success, technology acceptance, information systems, IT innovations

INTRODUCTION

Organizational culture has been confirmed within studies over the last twenty years as playing a vital part in the success of any change management process that organizations undertake. This research seeks to explore the relationship between organizational culture and Information Systems success. ES are examples of Socio-Technical IT Innovations. IT innovations bring significant change to organizations business processes, ways of working and workflows in addition to often requiring high investment in IT hardware infrastructure, eg (Bancroft, Seip et al. 1998; Baskerville and Myers 2002). However whilst ES make wholesale changes throughout organizations, failures at implementation and beyond are high, costing organizations much in terms of time, cost and effort. This research seeks to explore how organizational culture influences on the success of Enterprise Systems.

Why the focus on organizational culture? Organizational culture has been shown in many studies to significantly influence processes operating within organizations, (Denison 2001). Organizational culture has been cited as the medium, within which organizational functions and structures are embedded,(Deetz, Tracy et al. 2000), and organizational culture establishes the norms, values and beliefs that govern employee behaviour, (Schein 1996). Elements of Organizational culture influence the manner in which technology is accepted by an organization, (Davis, Bagozzi, & Warshaw, 1989). The social character of an organizations peer (employee) network affects the rate at which an IT innovation diffuses throughout an organization, (Rogers 1995). We therefore see support across a range of research settings that suggest organizational culture will influence the success of an IT innovation.

A few researchers have attempted to define the role that national culture plays in the use of an Information System (Cooper 1994; Krumbholz and Maiden 2001), and some have suggested that organizational culture impacts upon Information System (Davenport 1998; Murphy and Simon 2002; Myers and Tan 2002). However, research to date, whilst indicating that culture does play a role fails to identify **'how'** organizational culture affects these unique IT Innovations. This exploratory research seeks to address this gap and is focused in the domain of extended Enterprise Systems.

There is currently no model describing the role of organizational culture either in IT innovations or its operation in extended Enterprise Systems. Therefore this research will contribute new knowledge through the development of a model of the relationship of Organizational Culture to extended Enterprise Systems success

Research Aims and Objectives

The aim of the research study: To explore the relationship between organizational culture and IT innovations in the context of extended Enterprise Systems

The objectives of the research are: (A) Model the relationship between organizational culture and IT Innovations in the context of extended Enterprise Systems. This objective will be achieved through; A qualitative study of a representative sample of 20 stakeholders taken across public and private industry and drawn from vendor, client and implementation partner organizational settings. The result will be a model of the role of organizational culture to ES success (ESS). (B) Explore this relationship between organizational culture and IT Innovations in the context of extended Enterprise Systems in a revelatory case study. This will be achieved through; two case studies, one large public and one large private sector organization. The instruments to measure organizational culture is the Organizational Culture Assessment Instrument (OCAI) and the instrument to measure ES success is the ES impacts measure; both are questionnaire based instruments which have been validated in previous studies.

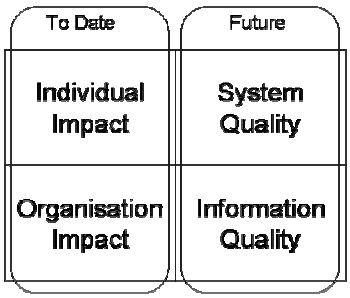
Following an extensive literature review the initial analysis of theoretical hypotheses, based around our chosen culture instruments and various models of technology acceptance and ES success however, did not lead to strong clearly defined relationships between the various dimensions and constructs comprising the models. Therefore, in order to more fully explore the role that culture plays, a research approach that is suited to exploratory, theory building needed to be undertaken, (Miles and Huberman 1994) suggest qualitative data is often advocated as the best strategy for discovery, exploration and developing hypothesis, the rest of this paper discusses this research and the multimethod approach adopted.

LITERATURE REVIEW

The research builds upon several existing models and theories, including the Technology Acceptance Model (Davis 1989; Davis, Bagozzi et al. 1989), Theory of Reasoned Action (Fishbein and Ajzen 1975), Diffusion of Innovation theory (Rogers 1995), Information System success models (DeLone and McLean 1992; DeLone and McLean 2003), the ES success measurement model, (Gable, Sedera et al. 2003) and various models of organizational culture.

Enterprise System Success

Figure 2: The ES success model



In looking at models of system success the most cited IS success model is that of (DeLone and McLean 1992; DeLone and McLean 2003), in which they proposed six major dimensions of information system success, system quality, information quality, user satisfaction, use, individual impact and organizational impact. Many empirical studies have considered notions of ESS and have built upon the work of DeLone & Mclean, including work, carried out by (Gable, Sedera et al. 2003) who conducted a study of ESS across 27 public sector organizations in Queensland, Australia that had implemented SAP R/3. Their extensively validated model and survey instrument operationalised five constructs and 42 sub-constructs and was tested across all Queensland Government agencies (Departments) that then had live SAP systems, yielding yielded 311 valid survey responses. The validated model has four quadrants: (1) Individual Impact, (2) Organizational Impact, (3) Information Quality, and (4) System Quality, representing four distinct but related dimensions of the multidimensional phenomenon – Enterprise Systems Success. The ES success model (Sedera, Gable et al. 2004) is shown and has been selected for this study.

Figure 1. The ES success model has been selected for use in this study.

Organizational Culture

The concept of culture, which was founded in anthropology, has been appropriated by other disciplines to examine issues of organizational behavior and performance. The word 'culture' had historically been usually reserved for societies or for ethnic or regional groups, however the phrase was coined by early writers on organizational cultures since it can be applied equally to other human categories such as an organization, a profession or a family (Hofstede 1980).

One definition of culture, taken from (Schein 1985), suggests that culture is, 'a pattern of shared basic assumptions that the group learned as it solved its problems of external adaptation and internal integration, that has worked well enough to be considered valid and therefore, to be taught to new members as the correct way to perceive, think and feel, in relation to those problems'. In the literature there are many models that attempt to describe organizational culture, for example, (Cooke, Rousseau et al. 1988; Trompenaars 1993). Some of the models are based on primary empirical research whilst others are based on secondary research and use other's finding to pull together several concepts into one unified model. It is therefore difficult for a researcher to recommend one particular model has having captured the essence of organizational culture over the others. There does however seem to be consensus within several aspects of defining organizational culture and many of the models consider the following common aspects of organizations as being important: elements of the culture of the organization: Values, Assumptions, Artefacts and Rituals.

Measuring Organisation Culture: The tension between quantitative and qualitative analysis

In comparison to the physical sciences, the social sciences, including studies on organizational culture, deal with systems at a much higher level of complexity and with each higher level an extra dimension of complexity is added, (Von Bertalanffy 1968). Some researchers have studied culture via qualitative techniques other researchers have studied culture utilising quantitative methods and many instruments, primarily survey in nature have been published in the literature, eg, (Litwin and Stringer, 1968) 9 point instrument and (Hofstede 1990) values survey module questionnaire. Indeed the myriad methods adopted to study the culture phenomenon only serve to support the lack of consensus and clarity within the field. However a suitably validated and empirically tested quantitative instrument was identified for our study, the Organization Culture Assessment Instrument (OCAI) survey (Cameron and Quinn 1999). The instrument itself is based upon the Competing Values Framework (CVM) which is shown below and describes the four culture types identified, Clan, Adhocracy, Market and Hierarchy culture types.

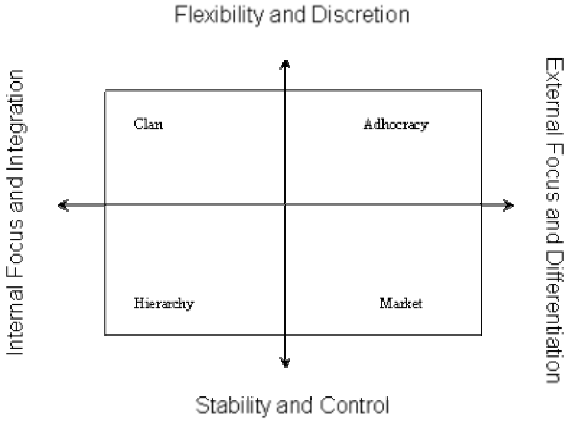


Figure 2. Competing Values Framework, (Cameron and Quinn, 1999)

RESEARCH DESIGN: MULTI METHOD APPROACH

The research design incorporates both qualitative and quantitative methods in a multimethod approach. There are benefits to be gained by utilising both qualitative and quantitative methods in IS research and many researchers suggest that both approaches can be successfully utilised within IS research, (Gable 1994; Myers 1997; Mingers 2001). Combining several research methods into a single study can provide a richer understanding of a research topic, each method focussing upon different aspects of the reality, (Mingers 2001). Other researchers have adopted multimethod approaches in organizational culture studies and include (Hooijberg 1996; Ashkanasy, Wilderom et al. 2000).

Due to the difficulties experienced in constructing hypotheses linked to the OCAI and ESS instruments is was identified that the study called for an initial qualitative exploratory phase. The purpose of the qualitative element of the study is to surface the variations in the experience of organizational culture on IT Innovations and identification of factors that influence the success of the innovation, in the context of extended Enterprise Systems. There are many qualitative data collection methods available however, a research interview is the data collection method used in this research. Interviews allow the experiences of the relationship to be surfaced and provide the richness of data required. In reviewing the literature both (Yin 1994) and (Miles and Huberman 1994) suggest that dependent upon the level of detail in the data, 15 to 20 cases, seem to represent a good balance between data richness and manageability. The qualitative phase is followed up by the quantitative phase.

The purpose of the quantitative element to the study is two fold. Firstly, to gather further data regarding the examples given by the interviews the data collected informs on organizational culture and ESS; Secondly, to elaborate upon the relationship between organizational culture and ESS. The qualitative data analysis will inform upon the factors influencing the success of the IT innovation and through the operant model so assist to describe the role of organizational culture in the relationship. The research design is shown below:-

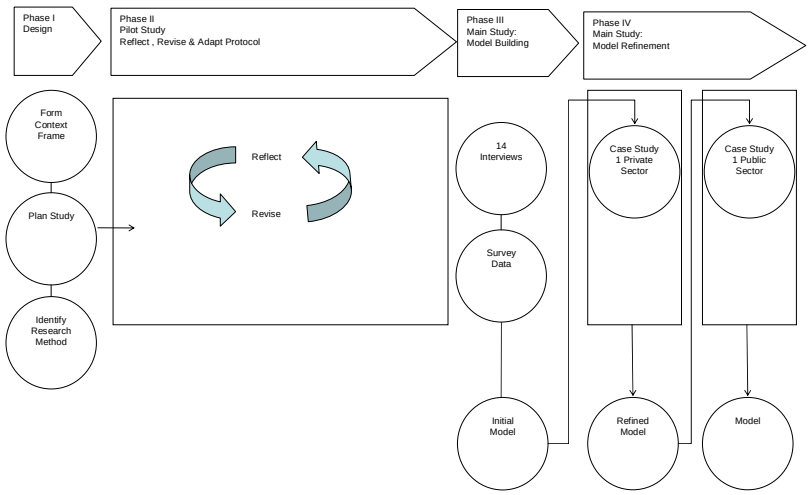


Figure 3. Multimethod research design

In summary, after having reviewed the research problem and the various research methods available, it was concluded that a multimethod approach was the most appropriate approach for the study.

Many of our research questions centre on questions such as, 'Who do we ask that can comment on the role that organizational culture played on ES innovations?' 'Who do we ask to describe a firm's culture?' and 'From whose perspective do we measure a successful innovation?' The key actors in the ES, ESS and organizational culture relationship are the firms that implement the system, the vendors, the implementation partner and the product itself, and in terms of system success, the system can be classified as successful/not successful, with various sub stages of success; infusion, exploiting, problematic and stalled after (Markus and Tanis 2000). The conceptual framework for the actors in the problem space is shown below:-

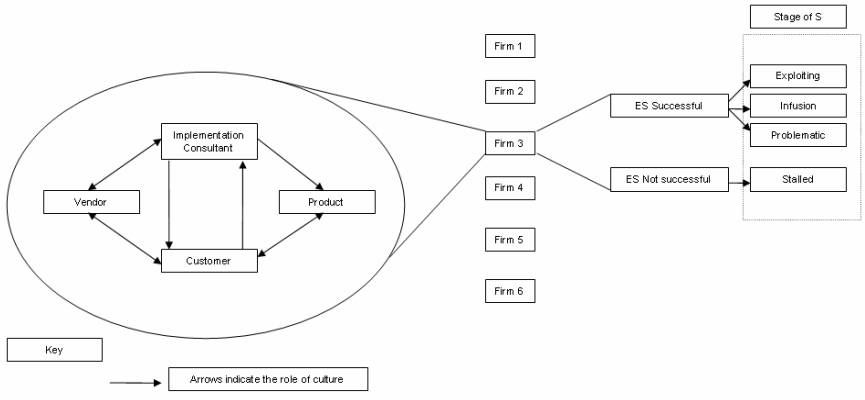


Figure 4. Actors in the problem space

These various actors in the problem space, we have identified are in unique positions to inform on the relationship between organizational culture and IT innovations in the context of ES.

VENDOR CONSULTANTS (VC'S): Vendors are those organizations that develop and market the ES innovations. Vendors will influence the client organization in a number of ways since when an ES innovation is adopted by a client organization the changes to that organization can be many. The ESS sub constructs indicate some the influences and these include; Individual impacts on how users in the organization work, individual productivity and task performance; System impacts such as necessary hardware platform, ease of use, ease of

learning, access, system features, system accuracy, flexibility, reliability, efficiency, sophistication, integration and customization; Organizational impacts include: Application Portfolio, Number Applications, Organizational Costs, Staff Requirements, Overall Productivity and Business Process Change; Vendor consultants will be able to inform on the organizational culture of the customer organizations and the level of success achieved by the ES innovation;

IMPLEMENTATION PARTNERS CONSULTANTS (IC'S): can inform on; the culture of the organization that is/has installed the system; the features of the software and the current system lifecycle stage of the current installation; the culture of the vendor; and the differences in cultures and successes of ES installations across a range of firms that the IC has been involved in; the success or failure of the system and the stage of success of the system in the client organization.

CUSTOMERS – INTERNAL CORPORATE CONSULTANTS (CC'S): can inform on the organizations that have adopted an ES innovation and are clearly able to inform on their own organizational culture, their perceived level of success with the innovation and the changes that the innovation has brought to the users, organization and the system. Within these organizations, not all employees will be in a position to inform on the impact that a particular innovation has had on the organization, issues such as role, seniority, use of the innovation come in to play. Yet there are 'Internal Consultants' that are in unique positions to inform on the innovation, the organizational culture of various business units in the organization and the level of success achieved by the innovation. Internal Consultants are known variously as Change Managers, Strategic Managers and Implementation Managers. However they are titled by the organization they will have some key experiences to relate.

RESEARCH FINDINGS AND PROGRESS STATUS

The research to date has achieved a number of milestones as follows:-

1. Research Design completed & Interview protocol developed
2. Participating pilot study Consultants identified & Participating organizations confirmed
3. Pilot data collection conducted in August 2004 & Pilot data analysis currently being undertaken. Main study data collection commencing
4. Preliminary model being developed

CONCLUSION

The role that organizational culture plays in the success of an Information System is not fully understood and to date no one has been able to demonstrate 'how' culture impacts on ES success. This research, utilizing a multimethod approach, will define the role that organizational culture plays in shaping dimensions of ES success. Initial results will be presented at conference.

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